That one who knows and loves his subject so thoroughly as does the author of this volume should furnish a mine of information about the Broads, is only what might be expected; but Mr. Ready is also possessed of a pleasant and readable style, although it may be noted that on the very first page he writes "Peninsular" when he means "Peninsula." Perhaps the three most interesting chapters out of the twelve which form the volume are those on birds' nests and fishing; and attention may be specially directed to the account of the nests of the great grebe—locally known as loon—and the buzzard, the former being illustrated by an excellent reproduction from a photograph. In the chapters on fishing much space is devoted to eels and eel-spearing; and it may be noted that in the author's opinion the old-fashioned spear on which eels were impaled is less cruel than the modern weapon in which they merely become entangled between the prongs. For while the former meant death, the latter allows a number of mangled fish to escape.

The illustrations, in addition to the one of the grebe, depict broadland scenery, Wrexham Hall and Church, various implements connected with eel-fishing, and other local subjects.

R. L.

DR. JOHN PEILE.

THE death of the Master of Christ's College, Cambridge, has removed from the University a striking figure, and from the college over which for twenty-three years he presided so successfully a great master. Dr. Peile came of a well-known Cumberland family. His father was Mr. Williamson Peile, of Whitehaven, a geologist of repute. The late master was born in 1838, and was educated at Repton, whence he proceeded to Christ's College in 1856.

Dr. Peile had a distinguished university career, being bracketed Senior Classic in 1860, and winning the Craven Scholarship the year before, and being bracketed Chancellor's Classical Medallist in 1860. Soon after taking his degree, he became a fellow and lecturer of his college, and in 1870 he began his most successful career as a college tutor. This lasted until 1884, in which year he was elected reader in comparative philology in the University. In 1887 he succeeded Dr. Swainson as master of the college, and four years later, becoming vice-chancellor, he resigned his readership.

Dr. Peile took a large part in university matters. He was always on the side of progress, and, together with Henry Jackson and Henry Sidgwick, led many of the movements which have done much to advance learning in all its aspects at Cambridge during the last forty years. He was for an unprecedented time a member of the council of the Senate, and he took a foremost part in the movement for granting degrees to women, for the abolition of compulsory Greek, for the further provision of university buildings for science and other subjects, in the work of University Extension, and in the rearrangement of triposes and other examinations. He was in university affairs and politics a Liberal in the best sense of the word. His lifelong work in the cause of the higher education of women was recognised in the early "nineties," when he succeeded the late Prof. Adams as chairman of the council of Newnham College; and it was a great pleasure to him and to his wife to learn that the new building, opened only this term, was to be called the Peile building.

Dr. Peile's services to philology were those of the teacher rather than the discoverer. He was one of the first to introduce the study into England, and his manual of comparative philology and the little primer long held the ground practically unchallenged. These books showed a touch of taste and literary charm which are not often found in comparative philologists, perhaps rarely in any branch of science. When Brugmann's "Grundriss" summed up the results of twenty years' brilliant discoveries, Peile's books ceased to be useful, though they could not cease to be interesting. He never revised them. All through the period of transition, however, he was keeping abreast of the new discoveries, and acting on them. He brought a critical mind to bear on these; he took nothing on authority, and very often suggested a way of his own to meet the case. What struck the hearer was his humorous common sense. He had a sense of the fitness of things that kept him from pedantry. And the dullest details were illuminated by some chance remark, as when he lectured on the moods, he said one day, "Now you have Delbrück's view and my view; but I confess that I feel some misgiving when I see that we prove two contrary theories by the same examples." The lectures on comparative syntax probably contained his most original work. These were never published. Peile's infectious enthusiasm never failed to influence his hearers, and the impression is still quite strong after a quarter of a century.

In his own college, Dr. Peile was singularly successful in promoting the study of science in its widest sense. Christ's, which was the first college to award open scholarships in the natural sciences, has ever since maintained a high standard in science. Amongst Dr. Peile's pupils were the late Prof. Marshall Ward and the late Prof. H. Newell Martin, Prof. S. H. Vines, Prof. E. W. Hobson, Dr. W. J. Sell, Dr. H. J. H. Fenton, Prof. Liversidge, Prof. Percy Gardner the president of Queen's College, Dr. Rouse, Prof. J. G. Adami, Dr. A. C. Haddon, Prof. E. W. Brown, of Yale University, Prof. Graham Kerr, Dr. E. A. T. W. Budge, Dr. C. A. Barber, Dr. A. W. Rogers, of the South African Geological Survey, Prof. I. Gollancz, Mr. A. Hutchinson, Mr. R. H. Rastall, Mr. A. W. Clayden, Dr. F. H. A. Marshall, Prof. Gwynne-Vaughan, Mr. C. Warburton, and many others who are holding up the lamp of science in all its forms in many parts of the world.

The master was an untiring worker, and devoted his energies, which were great, whole-heartedly to the services of the University and of his college. During his mastership, Christ's College has been greatly enlarged, and to a great extent rebuilt. The chapel and the hall have been decorated by the late Mr. Bodley, and the same architect rebuilt and rearranged the library. A third court has been opened up, and contains a handsome building, with sets of students' rooms, and a more recently constructed pile of lecture-rooms erected at the time of the quatercentenary of the college. John Peile was a wise counsellor, a loyal colleague, absolutely unselfish and unself-seeking. He has left an impress on his University and on his college which can never be effaced.

NOTES.

BY the bequest of the late Mr. F. Tendron, for many years chairman of the St. John Del Rey Mining Company, the trustees of the British Museum have recently acquired a few choice mineral specimens. Conspicuous among them is a magnificent, and probably unique, crystal of pyrrhotite, measuring as much as fourteen centimetres across. The suite also includes smaller specimens of pyrrhotite, two specimens of the rare mineral chalmersite, some well-crystallised gold, &c.

The States of the South African Union have decided to present to His Majesty the King a representative collection of living specimens of the wild animals of the country, and arrangements are already in progress for bringing together the collection and transporting it to England. The latter part of the task will be under the superintendence of the Zoological Society of London, in whose menagerie it is hoped that the whole collection will be ready for exhibition next summer, under the title of the King's African Collection.

It is announced in *Science* that the original laboratory of Liebig in Giessen is to be purchased and preserved as a memorial to the eminent chemist. An anonymous donor has guaranteed 3000*l.* for this purpose.

We notice with deep regret the announcement that Mr. J. W. Clark, who until quite recently held the post of Registrary of the University of Cambridge, died on Monday, October 10, at seventy-seven years of age.

The death is announced of Prof. W. H. Niles, Meredith professor of geology at the Massachusetts Institute of Technology. Prof. Niles was appointed to the chair in 1871, and was known for his contributions to geology.

The death is announced, at fifty-five years of age, of Dr. F. W. D. Fraser, formerly professor of anatomy and physiology at the Imperial University of Osaka, Japan; and also of Mr. A. H. Stokes, until recently Chief Inspector of Mines in the Midland district, at sixty-eight years of age.

We record with regret the death, on October 5 at Eastbourne, of Mr. Cecil H. Leaf, known for his studies of cancer. Mr. Leaf was in 1900 appointed to the staff of the Cancer Hospital, and at the time of his death was one of the senior surgeons of this institution. He was the author of numerous important surgical works on cancer of the breast, diseases of the rectum, experiments with chloroform, and other subjects.

Prof. A. Vambéry, the well-known Orientalist, completed on Sunday his fiftieth year of membership of the Hungarian Academy of Sciences. In honour of the occasion the society presented him with a jubilee diploma on Monday, October 10. The *Times* correspondent at Vienna states that in the course of the day Prof. Vambéry received congratulatory visits from a large number of Hungarian men of science and others, as well as telegrams of congratulation from learned bodies and friends in England and America. A subscription has been opened for the purpose of founding a Vambéry scholarship in philology.

We notice with regret the death of M. Maurice Lévy, who became a member of the Paris Academy of Sciences in 1883, when he took the place vacated by Bresse. M. Lévy was born at Ribeauvillé in Alsace in 1838. After studying at the École Polytechnique he entered the corps des Ponts et Chaussées, becoming eventually inspector-general. In 1885 he succeeded Serret as professor of mechanics in the Collège de France. His work was chiefly connected with mechanics and mathematical physics. His best known mathematical researches were on elasticity, hydrodynamics, action at a distance, and conservation of energy.

The Berlin correspondent of the *Times* has announced the death, on October 5 at Charlottenburg, of Prof. Ernst von Leyden in his seventy-eighth year. In 1865 Leyden was appointed professor at the University and director of the Klinik at Königsberg. In 1872 he was sent in the same capacity to the newly founded university at Strassburg. Four years later he succeeded Traube at Berlin, where he continued to work until 1907, when he retired. Leyden was the author of a work on the diseases of the spinal cord and of other medical books. He was a corresponding member of various foreign medical societies, and amongst other distinctions he received a patent of hereditary nobility.

The death is announced of Mr. John Roche Dakyns, who for thirty-four years was attached to the Geological Survey. He was born in St. Vincent, West Indies, on January 31, 1836, and died at Beddgelert on September 27. After joining the Geological Survey in 1862 he was actively engaged for twenty-two years in Yorkshire and the bordering counties of Derbyshire, Lancashire, and Westmorland; for ten years he was occupied in mapping the central Highland rocks in the counties of Perth, Stirling, and Dumbarton, and he was engaged during two years in the neighbourhood of Abergavenny before he retired from the public service in 1896. He was part author of numerous memoirs of the Geological Survey, and he contributed papers, mainly on Carboniferous and igneous rocks, and on Pleistocene deposits, to the Geological Society, the *Geological Magazine*, and the Yorkshire Geological and Polytechnic Society.

The lecture list of the London Institution for the session 1910–11 includes the following subjects:—Secrets in a pebble-beach, Cecil Carus-Wilson; malaria, Major Ronald Ross, F.R.S.; smoke and its prevention, Prof. Vivian B. Lewis; autumn and winter, the web of life, F. Martin-Duncan; Cretan discoveries, David G. Hogarth; the art of aviation, R. W. A. Brewer; life and work of Lord Kelvin, Prof. S. P. Thompson, F.R.S.; and the art of Palæolithic man, Dr. A. C. Haddon, F.R.S.

In connection with the London County Council's work of indicating the houses in London which have been the residences of distinguished persons, a tablet has been affixed to No. 4 Marlborough Place, St. John's Wood, N.W., where at one time Huxley lived. Huxley moved into the house in 1872, and lived there nearly twenty years. Most of his letters in London were written at Marlborough Place, and a picture of the house appears in his "Life and Letters."

A copy of the list of the zoological gardens of the world in September, compiled by Capt. S. S. Flower, of the Zoological Gardens, Giza, Egypt, has been received. The list includes the names of 104 such gardens in existence at the date specified, as well as references to many others now closed or in process of formation. The oldest of the gardens appears to be the Schönbrunn in Vienna, founded in 1752; the zoological garden in Madrid was opened in 1774, and that in the Jardin des Plantes in Paris was inaugurated in 1793. The gardens in Regent's Park date back to 1828. Two collections have been opened this year, one in Munich and the other in the Edgbaston Gardens, Birmingham.

Prof. Raymond McFarland, of Middlebury College, Vermont, has just returned from a two months' tour of exploration, during which he penetrated into parts of western Labrador never previously visited by a white man. During the first part of his journey, from Lake St. John to the Mistassini post of the Hudson Bay Company, he was accompanied by two colleagues, Profs. T. C. Brown and P. N. Swett. His companions then left him in order to make magnetic observations and to study geological formations along the Fiel Axe and Chief Rivers. Prof. McFarland, with a single Indian guide, then travelled a hundred miles further north, visiting hitherto unexplored regions to the east and north of Grand Lake, Mistassini, and climbing the Porcupine range of mountains. The three explorers are well satisfied with the results of their expedition, having brought back many valuable geographical and geological data.

PROF. E. FUGGER, of Salzburg, one of the explorers of the newly discovered ice-cave near Obertraun, in the Hallstadt region of Upper Austria, has favoured us with the following particulars relating to it. The opening is visible from Obertraun, and lies 1600 metres above the sea in the back wall of a cirque between the Mittagkogel and the Hirschberg. A low, narrow passage leads into a hall 10 metres high, the floor of which is covered with ice, bright and clean as a mirror. A cone of ice rises nearly to the roof. After a steep descent of 25 metres an ice-lined cathedral is entered, measuring 40 metres from floor to roof. The floor is strewn with blocks of ice 4 to 7 m. high, the walls are thickly coated with ice, and an ice-pyramid rises here also almost to the roof. A ridge of ice, running in the direction of the length of this cave, leads upwards from it into a gigantic ice-grotto, containing superb needle-like groups of ice-crystals. From a conspicuous group, styled "Monte Cristallo," a stream of clear ice stretches eastward for more than 100 m., leading up to a cross-passage. The right-hand passage is free from ice, and a tooth of *Ursus spelaeus* was found in it. It can be followed into another large hall 100 m. long, 50 m. wide, and 25 m. high, with a castle-like mass of ice rising from its floor. An ice-chasm has now to be scrambled down to an imposing doorway of ice, from which a very narrow passage, 20 m. long, leads into a hall 200 m. long and at least 30 m. high. This hall is free from ice, and breaks up into a series of tunnels, in some of which water-worn pebbles indicate the course of an ancient stream. The total length of the series of caves is 2000 metres. Where ice prevails, the temperature is from 0° to 1° C., while it rises to 5° C. in the portions free from ice.

UNDER the title of "Byways in the Caucasus," in *Travel and Exploration* for September, Colonel C. E. de la Poer Beresford gives a graphic account of a tour through a region which was the scene of some of the hardest fighting in the great struggle between the Russians and the tribesmen. He describes Gergebil, which was attacked by Vorontzoff in June, 1847, when held by the Murids under Shamil; Gunib, the famous fortress into which Shamil retired in 1857 after waging war against the Russians for twenty-five years; Akhoulgo, like "Edinburgh Castle with another higher rock covering Scott's and Wallace's monuments, rivers rushing round their bases, and a connecting ridge between the rock and Arthur's Seat." He commends the system by which the Russians have reduced these stubborn mountaineers to subjection to the notice of British officers now engaged in the task of subduing the frontier tribes like the Afridis and Waziris.

IN the twentieth Bulletin of the Sleeping Sickness Bureau the records of fifty cases of sleeping sickness in Europeans are tabulated and discussed. Of these cases, forty-five were men, five women; nineteen came from the Belgian Congo, fourteen from the French Congo, and four from Uganda. "Of the fifty patients, thirty are known to be dead, eleven survive, and the fate of the remaining nine is uncertain. Of the thirty, fourteen lived a year or more after trypanosomes were discovered, and four two years or more. Of these, one lived three and a quarter years and one six years." One of the survivors, infected probably in 1900, but possibly earlier, is considered to have made a real recovery, and there are grounds for hope that at least four other cases have done the like. Full clinical details of the cases and their treatment are given. The case that is regarded as cured was treated with Fowler's solution.

THE *Journal of Hygiene* (vol. x., No. 2) contains a memoir by Miss Harriette Chick on "The Process of Disinfection by Chemical Agencies and Hot Water," giving the results of experiments with phenol on *Bacillus typhosus*, *B. coli communis*, and *Staphylococcus pyogenes aureus*, and with hot water on the same three species and on *Bacillus pestis* and *B. paratyphosus*. It is concluded that "disinfection is an orderly time-process, which may be considered analogous with a chemical reaction." "The fact that the individuals [in a culture of bacteria] do not die all at once, but at a rate proportional to the concentration of the survivors at a given moment, is to be attributed to temporary and rhythmical changes in resistance which, by analogy with chemical processes, may be supposed to be due to temporary energy changes of the constituent proteins."

IN the Launceston *Examiner* of August 23 Mr. H. H. Scott records the discovery of a skeleton of Diprotodon in the Smithton district, this being the first record of the occurrence of the genus in Tasmania. The species is presumed to be identical with the Australian *D. australis*.

ACCORDING to their reports for 1909, all the five museums of the Cape of Good Hope have suffered from shortness of funds, largely owing to the policy of economy rendered necessary by the present state of the colonial finances. In the case of the South African Museum, lack of space for exhibition purposes and the numerical inadequacy of the staff have likewise hindered progress. The director of this institution states that, in his opinion, the time has come for prohibiting the export from South Africa of ethnological and anthropological relics. The plea for the prohibition is based on the systematic manner in which such objects have of late years been exploited, and the high prices paid for them.

THE August number of the Journal of the South African Ornithologists' Union contains the report of the migration committee for 1908–9. Eight records of the arrival of storks, either singly or in parties, are chronicled, from which it appears that December is the month when most of these birds reach Cape Colony, although the period of immigration lasts from September to January. In a separate communication Mr. Haagner states that four storks marked by the Vogelwarte Rositten and five by the Royal Hungarian Central Ornithological Bureau have been taken in South Africa, but adds that many more records must be secured before full knowledge of the migration of these can be obtained. Mr. Seebohm, for instance, was of opinion that the birds which travelled farthest north of the equator likewise flew farthest south, but another observer has suggested the reverse of this. Only one record of the movements of the cuckoo is mentioned, this being a departure in the middle of March. No reference is made to a query which recently appeared in the *Field* as to whether cuckoos ever utter their characteristic note in South Africa.

A NOTEWORTHY paper by Dr. M. Nowikoff appears in the August number of the *Zeitschrift für wissenschaftliche Zoologie* (Bd. 96, Heft 1) on the structure, development, and significance of the parietal eye of saurians. The author's investigations were conducted chiefly upon species of Lacerta and Anguis. The parietal or pineal eye in these genera agrees closely in histological structure with that of Sphenodon, but the author finds that it is innervated from the right habenular ganglion, and not from the left as Dendy has shown to be the case in the Tuatara. He now adopts the view that the pineal eye and epiphysis are dislocated members of one and the same pair of sense-organs, serially homologous with the lateral eyes, as Dendy has also maintained in the cases of Sphenodon and Geotria. He suggests that, inasmuch as the pineal eye is well developed in small and unprotected lizards, it is, though incapable of image-formation, probably still of service in giving notice of the approach of an enemy flying in the air when the lizards are sleeping in the sun with their paired eyes closed.

We have recently had an opportunity of seeing at work the large new microtome brought out by the Cambridge Scientific Instrument Company. It is designed to cut flat sections up to 150 × 120 mm., the thickness of which can be varied by 0·002 mm., the maximum thickness of the section being 0·06 mm. The sliding carriage, in which the object, embedded in paraffin or celloidin, is held, is moved backwards and forwards on plane guides by a handle working through levers. The object is fed upwards by a ratchet turning a toothed wheel, and an arrangement similar to that found in the well-known rocking microtome of this company is adopted to lower the object-holder on the return stroke, so as to prevent the object fouling the knife. The knife can be very securely clamped either at right angles to the direction of movement of the object, when the latter is embedded in paraffin, or at an oblique angle when cutting celloidin. Arrangements are provided for changing the inclination of the cutting edge of the knife, and there is a small angular scale on the knife-holders, so that the angle found most suitable when cutting a particular object can be easily noted and repeated. The strength and rigidity of the instrument are striking features, but the care and attention devoted to the details of construction are no less evident, the device just mentioned, for reading off the angle of the knife, being an example of the useful details which will be greatly appreciated by the operator. We have seen a number of sections, cut by this microtome, of various tissues which can be cut only with some difficulty, which demonstrate the capabilities of the instrument, and we can recommend it to those whose work necessitates the preparation of large flat sections of material containing cartilage, decalcified bone, and other resistant tissues.

A small pamphlet on the cultivation of mushrooms, of which Mr. R. L. Castle is the author, has been published in the series of "One and All" garden books. It can be recommended as a practical and authoritative guide.

A list of varieties of sweet peas classified according to colour has been prepared by the National Sweet Pea Society, and is published in the *Gardener's Chronicle* (October 8). It is described as an up-to-date selection of varieties in commerce, and comprises sixty-three varieties grouped in twenty-five classes; the first item in each class is that which produced flowers most true to colour in the society's trials. The society has also issued a list of varieties "too-much-alike" with the intention of allowing only one out of each colour group to be shown on a competition stand. Further, the society is taking steps to arrange for the registration of new varieties.

A collection of plants obtained by Mr. G. Nakhara in the southern half of the island of Saghalien is described by Mr. G. Koidzumi in the Journal of the College of Science, University of Tokyo (vol. xxvii., art. 13). It provides a supplement to the list of plants collected and determined by Dr. Fr. Schmidt in 1868, to which it adds about fifty species—one, *Cirsium Mamiyanum*, being new to science—and raises the total number of ferns and flowering plants to three hundred. A dozen species are limited to the Ochotsk region, including an Abies and a Picea. The special features of the flora are a predominance of the families Compositæ and Rosaceæ, and the small proportion (3 : 2) of species to genera.

On the subject of tree plantations in Inverness-shire Mr. W. Dallimore places on record in the *Kew Bulletin* (No. 7) some useful data regarding cost and the species that have given good results on different estates. The area planted on the Ardverikie Estate since 1873 exceeds 10,000 acres, for which 34,000,000 plants have been required. Scots pine, larch, and spruce have been most extensively planted; the pine and larch have grown well on dry ground at altitudes exceeding 900 feet, while the spruce has succeeded better on wet ground, but *Abies nobilis* has, on the whole, proved more vigorous than any of the three. The cost of planting, including fencing, is given at 3*l.* 12*s.* per acre. Interest attaches to a note regarding a larch forest on the Invergarry Estate that at an early stage was condemned on account of the larch disease, but was spared at the urgent request of the forester in charge, and has now developed perfectly clean, straight trees.

The issue of the *Geographical Journal* for October includes the paper on the land of the Incas, read before the society by Sir Clements R. Markham, K.C.B., F.R.S.; the paper provides a graphic account of southern Peru and part of the north of Bolivia, with their variety of climates, geographical features, and products. The land of the Incas extends from the water-parting of the maritime Cordillera to that of the eastern Andes, and from the gorges through which the rivers force their way into the Amazonian plain to the Knot of Vilcañonota, where the two Andean chains unite. The paper gives interesting glimpses at the Tiahuanacu ruins of unknown history, and shows how intimate is the author's knowledge of this part of South America. In the same issue appears Major G. F. A. Whitlock's paper on the Yola-Cross River Boundary Commission, Southern Nigeria, from which some idea can be obtained of the difficulties of accurate surveying in little known countries. Mr. Edward A. Martin gives an exhaustive account of further experiments he has made on dew-ponds. He has come to the conclusion that very rarely does dew ever form on the surface of ponds, and rarely on the puddled margins. He holds that if we continue to use the term dew-pond we must remember that the word must be used in the widest sense as including any form of condensation out of the atmosphere. Rain appears to be the all-important replenisher of these as of all other ponds which are not fed by springs.

The application of the method of correlation to investigations of the connection between meteorological elements at different places promises to be a fruitful, though somewhat laborious, method of approaching the problem of seasonal forecasts. In a note in Bulletin 4, 1910, of the Central Meteorological Observatory of Japan, Dr. T. Okada has correlated the mean monthly pressures and temperatures for some places in the Far East. He finds that at Zikawei (Shanghai) the coefficient of correlation between pressure and temperature in December is $-0{\cdot}764 \pm 0{\cdot}050$. Taking pressure at Zikawei and temperature at Nagasaki, 500 miles distant, he finds for the value of the coefficient −0·644±0·076. Thus high pressure at Zikawei is accompanied by low temperature, not only there, but also at Nagasaki. Again, taking pressure at Zikawei and rainfall at Keelung, in northern Formosa, 450 miles distant, he finds for the value of the coefficient 0·925±0·037. Thus when pressure is high at Zikawei in winter rainy weather in northern Formosa may be confidently predicted. The paper includes diagrams, in which the relationships can be distinguished, but the definite numerical index furnished by the correlation supplies the meteorologist with much more satisfactory means of comparing the similarity with that for other places and of using the results in more extended researches.

INTEREST in the diurnal variations of the meteorological elements has been stimulated of late years by the addition to our knowledge of the analysed results of wind velocity for certain representative places, and by the difficulty of bringing into dynamical relation with each other the results for pressure, temperature, and wind. In Bulletin 4, 1910, of the Central Meteorological Observatory of Japan, Y. Tsuiji discusses the daily variation of wind and the displacement of the air at Nagasaki. After analysing the variation into its harmonic components, he attempts to connect it with the variation of pressure gradient deduced from the mean hourly values of pressure at the three stations Nagasaki, Fukuoka, and Kumamoto. He concludes that the phases of the variation of the components of wind are almost identical with those of the variation of the corresponding components of pressure gradient. Apart from any effect due to the earth's rotation, it would be expected that these phases would differ by 90°, and although the nearness of Nagasaki to latitude 30° might account for the identity in the phases for the diurnal wave, it is unlikely that the effect in the semi-diurnal wave can be attributed to such a cause. The author does not attempt to explain the anomaly. An examination and recalculation of some of the results shows that time is to be measured from 1 a.m. in the expressions given for the harmonic components, although it is stated that it is measured from midnight. Thus the diagram (Fig. 5) showing the diurnal and semi-diurnal waves is seen to be wrong by a comparison of the sum of the deviations at noon taken from the diagram with the actual values given in Table I. The fact that the phases of the diurnal term in the south and east components of velocity are almost exactly equal, while those for the semi-diurnal wave differ by 40° only, shows that convection is the predominating factor in determining the diurnal variation, and exercises a considerable influence on the semi-diurnal wave.

IN a paper which appeared in vol. xxxii. of the *Annalen der Physik* Dr. M. Knudsen, of the University of Copenhagen, describes an absolute manometer for the measurement of gas pressures not greater than a few thousandths of a millimetre of mercury. It depends on the measurement of the force of repulsion between two plates at different temperatures immersed in the gas, when their distance apart is extremely small compared with the mean free path of the molecules of the gas. This repulsion the author shows is equal in dynes per square centimetre to half the product of the pressure of the gas by the excess of the square root of the ratio of the two absolute temperatures of the plates over unity. The instrument consists of a polished copper plate, which is supported with its surfaces vertical by a thin platinum wire. Opposite part of one surface is the polished end of a fixed copper cylinder, the temperature of which can be raised above that of the suspended plate and the case of the instrument by sending an electric current through a platinum wire wound on it. The rotation of the moving plate about its suspension is determined by means of a mirror attached to the plate, and thermometers give the temperatures of plate and cylinder.

PROF. PATERNO, of the University of Rome, has given an account in the *Revue scientifique* of August 20 of some recent work on colloidal solutions, arising out of an early observation that tannic acid, which behaves as a colloid and produces no osmotic or cryoscopic effects in water, behaves in the normal way as a crystalloid when dissolved in acetic acid. The aqueous solution is a deep brown, although the tannic acid separating from it is white, and the solution in acetic acid is only yellowish. Observations by the ebullioscopic method indicated that the Grignard reagent, magnesium ethiodide, probably exists as a colloid in its ethereal solutions. Several alkaloids were found to dissolve in ether without raising its boiling point, whilst the alcoholic solutions showed a normal elevation.

IN an article in the *American Architect* for September 28 Prof. William H. Goodyear analyses the report of the Pisa Commission on the Leaning Tower, and brings forward evidence to show that the figures of the commission are in error. Prof. Goodyear maintains that the tower has moved 30 centimetres more than the commission has supposed, and that this movement had taken place before the date of De Fleury's "Monuments de Pise" in 1859. The actual movement, he says, has been one of 50 cm., not of 20; but this movement, which was probably caused by the earthquake of 1846, certainly occurred before 1859. Prof. Goodyear also challenges other results published by the commission. Thus the commission's supposed rate of inclination per metre in 1829 is 86½ mm.; the article gives the real average rate as 84 mm. The supposed present rate of inclination per metre is announced by the commission as 92 mm.; here it is said to be really 94½ mm. in 1859. The commission announces 20 cm. additional inclination between 1829 and 1910. There was really, it is said, 50 cm. additional inclination before 1859. The commission announces the rate of increase per metre between 1829 and 1910 as being 5½ mm. Therefore, says Prof. Goodyear, if the supposed increase of 20 cm. be divided by the rate of increase per metre, we ought to obtain the axial height on which the increase was figured, viz. the axial height of the tower. "But when this division is made, the resulting axial height is only 36·36 m., which is the axial height, according to Cresy and Taylor, of the six stories above the first, thus leaving the entire lower story, which is nearly one-fourth of the axial height, out of the computation."

AN illustrated article on the Portsmouth water works appears in *Engineering* for October 7. The borough of Portsmouth has recently put into commission a new system of filter-beds and covered service reservoirs. The new works are situated at Farlington, on the side of Portsdown Hill, distant five miles from Portsmouth. The water supply comes from chalk springs at Havant and Bedhampton, where pumping-stations are situated. The water is delivered through three rising mains to the filter-beds, from which, after passing through the service reservoirs, it gravitates to the town. Previous to the construction of the new works, the water was delivered from the pumping-stations to two open service reservoirs on Portsdown Hill; these are now covered, and form part of the reconstructed scheme. It was the practice under the old conditions to deliver the water in an unfiltered state from the open service reservoirs to the town. The raw water is normally excellent, owing doubtless to the underground chalk through which it passes, but discoloration occasionally occurs during wet weather following a period of drought. Ferro-concrete on the Hennebique system has been employed largely on the new constructional work.

IN this month's *Aeronautics* appears an announcement to the effect that, recognising the importance of flying from a military point of view, that journal offers to present a complete aëroplane to the first suitable officer of the army who applies for it and is willing to try his best to become proficient with it.

IN the article on "Mathematics in Austria," in NATURE of September 29, mention was made of arithmetic papers set by the Civil Service Commissioners and other examining bodies. The writer asks us to say that his allusion to the Civil Service Commissioners was due to his belief that they regulated the Army Qualifying as well as the Army Competitive examination. He has since found that the former is conducted by the "Army Qualifying Board." His reference, therefore, to the Civil Service Commissioners was incorrect.

A TRANSLATION into German by Prof. Julius Ruska of Prof. W H. Hobbs's book on "Earthquakes" has been published by Messrs. Quelle and Meyer, of Leipzig. A review of the original volume was published in the issue of NATURE for March 26, 1908 (vol. lxxvii., p. 481). The price of the German work is 6.60 marks.

OUR ASTRONOMICAL COLUMN.

ANNOUNCEMENT OF A NOVA.—A circular received from the Kiel Centralstelle states that in a telegram from Cambridge, Mass., received on October 5, it is announced that a new star in Sagittarius has been discovered by Mrs. Fleming on a plate taken on May 31·831 (G.M.T.). This object, Nova Sagittarii No. 2, was then bright enough to be visible in a small telescope, and its position is $\alpha=17$h. 52m. 15s., $\delta=27^\circ\ 32\cdot2'$ south, about 7m. west and 3° north of the third-magnitude star γ Sagittarii; like most other objects of its class, this nova lies in, or very near to, the Milky Way.

It is interesting to recall that Nova Sagittarii No. 1 was also discovered by Mrs. Fleming on a photograph taken at Arequipa on March 8, 1898, but was not detected until March, 1899.

TIME OF THE SOLAR TRANSIT OF HALLEY'S COMET.—The examination of various solar photographs for traces of Halley's comet during its transit of the solar disc on May 18 has hitherto been somewhat indefinite, because the exact times of ingress and egress were not certainly known. Figures which should permit of more definitive examinations are now given in No. 616 of the *Astronomical Journal*; they are as follows:—

	G.M.T. h. m.	
Ingress	15 40	... Angle 279°
Least distance between centres..	16 9	... Comet 3′ 15″ N.
Egress	16 39	... Angle 76°

OBSERVATIONS OF COMET 1910*a*.—In a Bulletin of the Catania Academy of Natural Science, just received, Prof. Riccò discusses the observations of comet 1910*a*, visual, photographic, and spectroscopic, made at the Catania Observatory during January and February. After describing the visual and spectroscopic results, Prof. Riccò directs special attention to the greater similarity of the visual and photographic images in this comet than in several which immediately preceded it, due to the greater proportion of yellow radiations. He also suggests that the appearance of the three "hydrocarbon" and one yellow band, when the comet was near perihelion, is in accordance with Hasselberg's experiment with a Geissler tube containing hydrocarbon and sodium vapours. With the tube cool, only the hydrocarbon bands showed in the spectrum, but when it was heated the sodium band was seen to be relatively strong.

It is stated in the *Observatory* (No. 427) that whilst the object observed by M. Sykora (NATURE, September 8, p. 322) was in the right position-angle, it was considerably too far from the centre of the disc.

ARABIAN ASTRONOMICAL INSTRUMENTS.—Vol. xli. (1909) of the *Sitzungsberichte der Physikalisch-Medizinischen Sozietät in Erlangen* contains No. 18 of Prof. E. Wiedemann's contributions to the history of science, which deals with some of the astronomical instruments of the Arabs (53 pp.). Chapter i. gives descriptions of the astrolabe and the quadrant, founded on two writings by Al Birûni in the Royal Library of Berlin. Chapter ii. gives a review of the trigonometry of the Arabs and its application to problems arising from the use of the gnomon ("determination of the shadow"). Chapter iii. contains an account (chiefly from Al Birûni) of the use of the astrolabe in surveying. The paper is of special interest on account of the many extracts it gives from unpublished manuscripts, and makes us hope that some further details may yet be brought to light about the instruments used in the great observatories at Cairo, Merâgha and elsewhere, as to which our knowledge is very imperfect.

NEW EPHEMERIDES FOR SATURN, URANUS, AND NEPTUNE.—For some time it has been a known fact that the observed positions of the three outermost planets showed considerable discordance with Leverrier's tables. In No. 427 of the *Observatory* Dr. Downing directs attention to the advance made by the compilers of the *Connaissance des Temps* in publishing, for 1912, ephemerides based on Gaillot's "Tables Rectifiées" instead of Leverrier's tables. A comparison of the respective corrections shows that an important step in advance, in the calculation of accurate ephemerides of the major planets, has been made.

IRREGULARITIES IN THE MOTION OF ALGOL'S SATELLITE.—In the October number of the *Bulletin de la Société astronomique de France* M. Enzo Mora shows that, according to observations made in 1908, 1909, and 1910, the relative motion of the satellite of Algol has been subject to an extraordinary perturbation. Comparisons made between the brightness of Algol and that of ϵ Persei, within about 40 minutes of the minimum of the former, indicate departures from the normal of the time of minimum ranging from 0 to 26 minutes. The latter figure is somewhat uncertain and unique, but the difference cannot be traced to observational error; prior to 1909 the departure from normal had never exceeded 6 minutes. The perturbative action of other satellites is suggested as a possible cause of these irregularities.

THE CAMBRIDGE OBSERVATORY.—The annual report of the work done at the Cambridge Observatory during the year ended May 18 is divided into two sections, in the former of which Sir Robert Ball gives an account of the general observations. From this we learn that the results of the investigations into the constant of aberration and the variation of latitude, made by Mr. Cookson during 1905–7, are being prepared for press by Mr. Stratton, while the manuscript photographic catalogue of 6000 stars, observed at eleven observatories during the Eros campaign, has now been completed by Mr. Hinks.

In the second part Prof. Newall describes the work done in the astrophysical department. The radial velocities of certain red stars, of which many show fluctuations of brightness with long periods of variation, are being investigated by Mr. Stratton. It is with regret that we note that some difficulty is being experienced in obtaining a perfect 12-inch objective, of 60 feet focal length, for use in the solar observations.

OBSERVATIONS OF NEPTUNE'S SATELLITE.—The observations of Neptune's satellite, made by Prof. Barnard with the 40-inch refractor during 1900–10, are published in No. 617 of the *Astronomical Journal*. A magnifying power of 700 was usually employed, but the satellite was frequently found to be an extremely difficult object; the recorded magnitudes range from 13·0 to 14·5.